

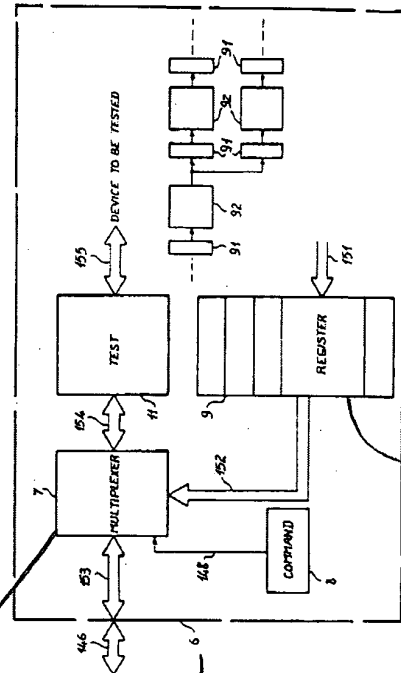
DOCUMENT-IDENTIFIER: US 4982403 A
TITLE: Electrical circuit testing device and circuit comprising the said device

----- KWIC -----

DEPR:
FIG. 5 shows a second example of the device according to the invention. In the example shown in FIG. 5, the testing device is integrated into the device to be tested. For example, the device to be tested 6 is an integrated circuit that does the fast Fourier transform (FFT). The external input/output bus 146 is connected to the internal input/output bus 153. The internal input/output bus 153 is connected to the multiplexer 7. The multiplexer 7 is connected, firstly, to the bus 154 and, secondly, to the bus 152. The bus 154 is a bi-directional bus connecting the multiplexer 7 to the testing device 11. The testing device 11 is connected to an internal bus 155.

U.S. Patent Jan. 1, 1991 Sheet 4 of 4 4,982,403

FIG. 5



mux

device to be tested
(an integrated
circuit)

	Document ID	Kind Codes	Source	Issue Date	Pages	
1	US 6003107 A		USPAT	19991214	54	Circu
2	US 5416409 A		USPAT	19950516	12	Appar
3	US 5090040 A		USPAT	19920218	22	Data
4	US 5005196 A		USPAT	19910402	21	Limb
5	US 5005195 A		USPAT	19910402	21	Digit
6	US 4982403 A		USPAT	19910101	8	Elect
7	US 4956859 A		USPAT	19900911	21	Sourc

DOCUMENT-IDENTIFIER: US 3801910 A
TITLE: EXTERNALLY ACCESSING MECHANICAL DIFFICULT TO ACCESS
CIRCUIT NODES USING
PHOTO-RESPONSIVE CONDUCTORS IN INTEGRATED CIRCUITS

----- KWIC -----

ABPL:

A structure for selectively externally accessing mechanically difficult to access circuit nodes in an integrated circuit by the combination of an externally accessible circuit terminal and a plurality of connecting means, each of which connect a particular circuit node which is difficult to access to said terminal. Each of the connecting means includes a photoconductive semiconductor device which is normally electrically nonconductive but which is adapted to electrically conduct when subjected to localized light such as a laser beam. When the particular photoconductive device is rendered conductive, it in turn makes the connecting means associated with it conductive and, thereby, provides a conductive path from the particular circuit node to the externally accessible terminal.

CLPR:

13. The testing system of claim 1 wherein said integrated circuit includes a

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Document ID	Kind Codes	Source	Issue Date	Pages
37	US 4110676 A	USPAT	19780829	9

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Dyn. Tac. App. CON. SEM. EXT. CAR

United States Patent (19)

Quina

(11) 3,801,910

(45) Apr. 3, 1974

(54) EXTERNALLY ACCESSING MECHANICAL DIFFICULT TO ACCESS CIRCUIT NODES USING PHOTO-RESPONSIVE CONDUCTORS IN INTEGRATED CIRCUITS

(75) Inventor: Hubert F. Quina, Ossining, N.Y.

(73) Assignee: International Business Machines Corporation, Armonk, N.Y.

(22) Filed: July 3, 1973

(21) Appl. No.: 268,407

(52) U.S. Cl. 324/158 D, 324/73 R, 324/158 R

(51) Int. Cl. G01r 31/36, G01r 12/12

(58) Field of Search 324/158 D, 158 T, 158 R, 324/73 R

(56) References Cited

UNITED STATES PATENTS

3,339,876 11/1970 Feiberg et al. 324/158 T

OTHER PUBLICATIONS

Donath, W. B.; "Testing of Integrated Circuits", IBM

Tech. Dis. Bull.; Jan. 1966; pg. 1166.

Primary Examiner—Alfred E. Smith

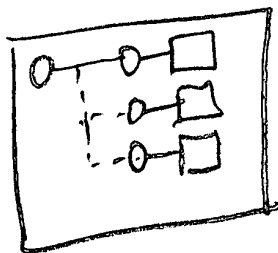
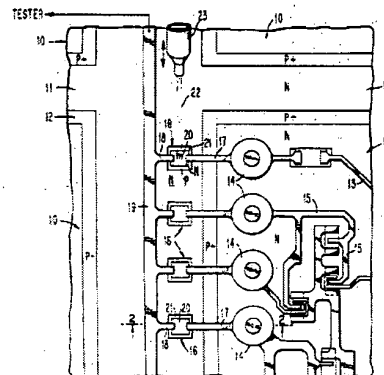
Assistant Examiner—Ernest F. Karlson

Attorney, Agent, or Firm—J. B. Kraft

(57) ABSTRACT

A structure for selectively externally accessing mechanically difficult to access circuit nodes in an integrated circuit by the combination of an externally accessible circuit terminal and a plurality of connecting means, each of which connect a particular circuit node which is difficult to access to said terminal. Each of the connecting means includes a photoconductive semiconductor device which is normally electrically nonconductive but which is adapted to electrically conduct when subjected to localized light such as a laser beam. When the particular photoconductive device is rendered conductive, it in turn makes the connecting means associated with it conductive and, thereby, provides a conductive path from the particular circuit node to the externally accessible terminal.

14 Claims, 4 Drawing Figures



DOCUMENT-IDENTIFIER: US 3849872 A
TITLE: CONTACTING INTEGRATED CIRCUIT CHIP TERMINAL THROUGH THE WAFER KERF

----- KWIC -----

ABPL:

A test system for selectively accessing mechanically difficult to access terminals in an integrated circuit chip by the combination of an externally accessible circuit terminal formed in the wafer kerf, a conductive bus bar formed in the kerf connected to the terminal, connecting means for connecting each of a plurality of chip terminals to the conductive bus bar, means for connecting the kerf terminal to a tester, and means for selectively activating a connecting means between the chip terminal and bus bar to provide conductive signal paths from selected chip terminals to the kerf terminal.

CLPW:

at least one externally accessible circuit terminal,

CCXR:

324/158.1

CCXR:

324/765

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United States Patent (19)

Hubacher

(11) 3,849,872

(45) Nov. 26, 1974

[54] CONTACTING INTEGRATED CIRCUIT
CHIP TERMINAL THROUGH THE WAFER
KERF

3,633,268 1/1972 Egner 29/574
3,634,731 1/1972 Slogmo 317/101

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Assistant Examiner—E. Wojciechowski
Attorney, Agent, or Firm—J. B. Kraft

[73] Assignee: International Business Machines
Corporation, Armonk, N.Y.

[22] Filed: Oct. 24, 1972

[21] Appl. No.: 300,075

[52] U.S. Cl.: 29/574, 29/563, 357/40,
357/48, 317/101, 324/158 T

[51] Int. Cl.: H01J 19/00, H01J 7/66

[58] Field of Search: 317/235, 22, 22.1, 101;
29/577, 574; 324/139 T

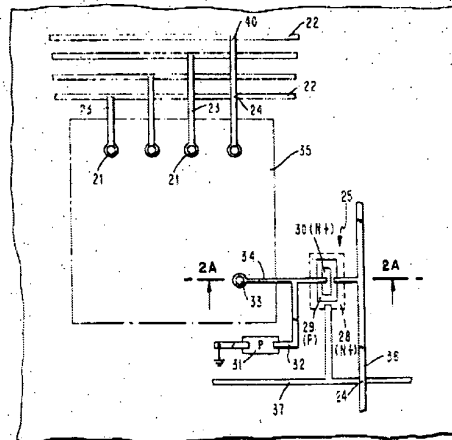
[56] References Cited
UNITED STATES PATENTS

3,539,876 11/1970 Feinberg et al. 317/101

[57] ABSTRACT

A test system for selectively accessing mechanically difficult to access terminals in an integrated circuit chip by the combination of an externally accessible circuit terminal formed in the wafer kerf, a conductive bus bar formed in the kerf connected to the terminal, connecting means for connecting each of a plurality of chip terminals to the conductive bus bar, means for connecting the kerf terminal to a tester, and means for selectively activating a connecting means between the chip terminal and bus bar to provide conductive signal paths from selected chip terminals to the kerf terminal.

8 Claims, 3 Drawing Figures



DOCUMENT-IDENTIFIER: US 5751159 A

TITLE: Semiconductor array and switches formed on a common substrate for array testing purposes

----- KWIC -----

CLPV:

a plurality of externally activated semiconductor photodiodes formed on the substrate in the epitaxial layers, with one each of a first group of the plurality of semiconductor photodiodes having a first terminal connected to each of the I/O row pads of the rows of semiconductor devices and one each of a second group of the plurality of semiconductor photodiodes having a first terminal connected to each of the I/O column pads of the columns of semiconductor devices, the plurality of semiconductor photodiodes having a second terminal connected to externally available electrical connections and each semiconductor photodiode having a light input positioned to be externally accessible.

CLPV:

fabricating a first plurality of externally activated semiconductor switches each having first and second terminals on the semiconductor substrate and connecting one each of the first terminals of the first plurality of

semiconductor switches to each of the I/O row pads of the

U.S. Patent

May 12, 1998

Sheet 1 of 2

5,751,159

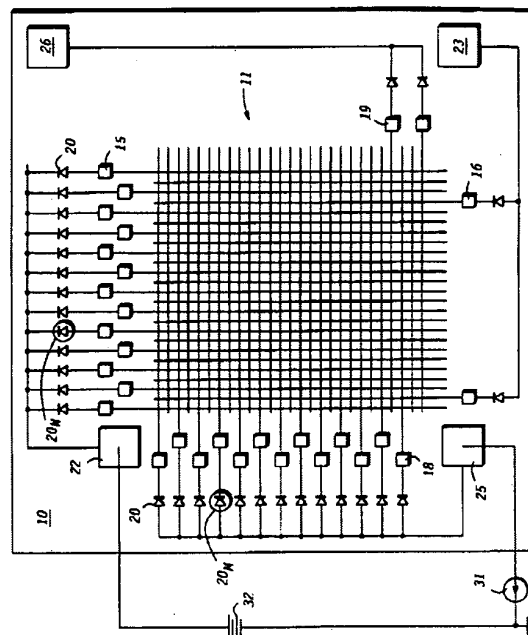


FIG. 1

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Application/Control Number: 09/954,883
Art Unit: 2829

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